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two directions must have taken place at the beginning of the embryonic history of the animal. My results therefore lend no support to the views in which Sertoli's cells are regarded as the modification of the sperm-producing cell proper or of its direct derivatives.

The differential staining was accomplished in a satisfactory manner by the use of two new aniline colors, viz: *Cyanine* and *Chromotrop.* *Erythrosine* has yielded also a very satisfactory result. The results of the application of these colors to the study of spermatogenesis and the differential staining of sexual cells after the manner of Auerbach, I shall report at no very distant future.—S. WATASE, Clark University, Worcester, Mass.

ENTOMOLOGY.[1]

A Spider Enemy of Oeneis semidea. — All butterflies seem to have enemies that prey upon them during some if not all stages of their existence, and *Oeneis semidea*, which lives on the top of our highest New England mountain, is no exception to the universal rule.

During a brief visit to Mt. Washington, N. H., during the summer of 1889 I was surprised while collecting on Semidea Plateau, as Mr. Scudder has very appropriately termed a favorite locality for this butterfly near the top of the mountain, to see great numbers of a dark bluish-black spider (*Pardosa albomaculata* Emerton) which seemed to be found everywhere, and was particularly noticeable along the carriage road leading from the lower end of this plateau to the summit. My first thought on seeing these spiders in such numbers was what were they doing at such an altitude, over 5000 feet; surely there were not sufficient flies at such an elevation to feed them, and in fact I saw none whatever; neither did I notice spider webs, and these would seem quite necessary were they feeding on flies. Therefore I took pains to learn, if possible, the reason of their being in that particular area and nowhere else observable on the mountain. I had noticed many dead and imperfect butterflies lying on the ground, especially along the roadway, but not suspecting the real cause, supposed they were killed by the passing of teams or exposure to the fierce cold winds which occasionally sweep across the mountain even in the summer time. It was not, however, until next to the last day of my stay on the summit that I discovered the true explanation for the great mortality among the butterflies and the presence of this peculiar spider.

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[1] Edited by Prof. C. M. Weed, Hanover, N. H.

Upon the day in question, with the thermometer at 40° and a cold misty wind blowing from the North, I was coming down the road from the hotel to Semidea Plateau when I caught sight of a butterfly a few yards ahead, on the ground which was being blown sideways by the wind while attempting to walk. What was my surprise to see one of the spiders rush from behind a small stone and leap upon and fasten itself with tiger-like grip upon the chilled and almost helpless butterfly At that instant I realized the significance of the act, and the question was settled in my mind why these spiders were to be found in this inhospitable region. Securing both spider and butterfly for future use and to make sure that this was not an unusual occurrence I shortly afterward made several experiments by placing partially dead butterflies near different spiders to watch their actions, and invariably they rushed upon them in a most ferocious manner. With a thread attached to a butterfly I induced a spider to follow it at least a rod in his mad endeavor to obtain the coveted prize.

It is my opinion, although I have positive knowledge only in regard to the perfect insect, that this spider subsists almost entirely upon *Oeneis semidea* during its various stages. One always sees them searching about among the rocks or sedge, apparently hunting for the egg, larva or perfect insect in hiding, and even when it is so cold and damp that the butterflies are chilled and scarcely move, the spiders do not seem to be affected but act as if it was their golden opportunity to obtain a dinner, and search for it at that time with unusual vigor. As my time and means were limited perhaps it would be well for future collectors who visit this locality to study more closely and carefully this peculiar spider in this bleak and bare region. Perhaps, like the butterfly, this, too, is a remnant of a once widely disseminated species, but which with the receding glaciers found conditions and food favorable for its existence only on the tops of our highest mountains.—SHELLEY W. DENTON, Wellesley, Mass.

Biology of the Chalcididæ.—Mr. L. O. Howard[1] has published an extremely interesting paper upon a subject concerning which he speaks with the authority given by years of careful study. It consists of a general review of our present knowledge concerning the life histories of the interesting hymenopterous parasites of the family Chalcididæ. The scope of the discussion is indicated by the following list of the sub-headings: The insects and stages of insects infested by Chalcidids; How the Chalcidid larva lives; How fast does it develop; How the larva transforms; How many develop in a single host; Proportions of sexes in issuing; Phytophagic habit; Parthenogenesis; How large is the family.

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[1] The Biology of the Hymenopterous insects of the family Chalcididæ, by L. O. Howard. Proc. U. S. Nat. Mus., No. 881.

Mr. Howard's conclusions concerning the number of species in the family will be a surprise to many entomologists. They indicate how much yet remains to be done in the field of descriptive entomology in America. The author says: "In this country (America, North of Mexico) the latest list (Cresson's, 1887) records only 413 species, while I have recorded (Bull. V, Div. Ent.), in addition to those, 128 species from Mexico and the West Indies. For the purpose of this paper I have gone carefully over the collection of the National Museum and estimate the number of species of this family contained in that one collection at something over 2000, nearly all from America, North of Mexico. According to my best judgment this represents a very small proportion of the species yet to be found within these geographical limits, as almost no effort at general collecting has been made, and these 2000 species are very largely the result of accidental breeding. When a single sweep of the beating net on the Department grounds at Washington will result in the capture of five new species what will be the result when the entire country shall have been collected over by sifting, beating and the many other devices known to experienced collectors? I fully believe that to estimate the number of species of this one family in North America as exceeding the number of described North American species of the entire order Hymenoptera would be far below the truth. When we consider, as shown in a previous section, that these small hymenopterous parasites live upon or within some one or several of the stages of perhaps the majority of insects of all orders, then we no longer wonder at their numbers or at the great variety exhibited among them."

The Gypsy Moth.—A recent issue of the *Salem* (Mass.) *Gazette* contains the following account of the Gypsy Moth developments in that region:

Amidst all the hue and cry against the importation of foreign contract laborers, foreign paupers and foreign fevers it is to be considered to what an extent this country has been victimized through the importation of foreign weeds, birds and bugs. A field of daisies may be an attractive sight from an æsthetic standpoint, but to the farmer it is simply a lot of undesirable white weed, spoiling a crop of good English hay. The little plant which rightfully bears the title of the royal

Plantagenets, and spreads its golden glory all over some of our neighboring hills, is practically a nuisance, and deserves its ignominious name of wood-wax, by which it is commonly known. These and the English sparrow are instances of unwise importation.

But the latest offender, and the prospect seems promising that he may prove the chiefest and worst, is the individual who first brought to this country a specimen of the gypsy moth. If he had taken the precaution to chloroform him—or her—or to impale the insect after the cheerful manner of his brother entomologists, the cause of science might have been enriched without danger to the cause of arboriculture. But the ambition of this collector vaulted above the low level of pin-stuck bugs. He would be the proud possessor of the only real live gypsy moth in America. He was for a time.

Then the moth, imbued with that new spirit of liberty which all other immigrants from monarchial tyranny are said to feel when they reach the home of the brave and the land of the free, just got away. It set up house-keeping on its own account and proceeded to raise a family. How well it succeeded in the latter operation is a matter upon which certain acts of the Legislature of Massachusetts and certain items of expenditure recited in the reports of the Auditor of the Commonwealth may throw some light.

The first instance of the appearance of the *Ocneria dispar*—this is the bug's company name—in the literature of the blue books, is at the head of chapter 95 of the Acts of 1890, wherein the Governor is authorized to launch a brand new commission on a long suffering public to consist of three suitable and discreet persons charged with the duty of preventing the spreading and securing the extermination of the gypsy moth.

The nameless individual who wrought the mischief by importing the progenitor of the race was protected by the constitutional prohibition of *ex post facto* laws from receiving a fit penalty for his dire offence; but it was provided that henceforth it should be unlawful for any person to knowingly bring the insect, or its nest, or its eggs within the Commonwealth, and that a fine of two hundred dollars or durance vile for sixty days should await the culprit convicted of breaking the laws.

Last year the Legislature repealed the act of 1890 but substantially re-enacted its provisions, except that it transferred the responsibility of selecting the suitable and discreet bug-hunters from the Governor to the State Board of Agriculture. Suitable and discreet persons cost something when these qualities are demanded by the Commonwealth.

They have cost so far an even hundred thousand dollars. Let it not be whispered in Gath that an extermination which exterminates would be undesirable for any such reason as that it would also exterminate the salaries. Governor Russell has just signed a new bill for seventy-five thousand dollars more, and forty men will immediately gird them for the fight.

And the end is not yet. Thirty towns and cities, covering an area of two hundred miles, have the prolific progeny of the unwelcome visitor already infested. Official circulars posted behind the Salem postoffice door impart the unwelcome intelligence that they are here.

If the ninety and nine moths are killed and the one that escapes becomes the happy parent of a quarter of a million or so of little gypsies, and this ratio of destruction and increase is maintained ad infinitum, where will the suitable and discreet men eventually be, and what will be left of the State Treasury but an empty chrysalis?

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

U. S. National Academy of Sciences.—This body met in Washington on April 18–21st for the transaction of business and the reading of papers.

The following papers were read:

The American Maar, G. K. Gilbert; The Form and Efficiency of the Iced Bar Base Apparatus of the U. S. Coast and Geodetic Survey, R. S. Woodward (Introduced by T. C. Mendenhall); On Atmospheric Radiation of Heat in Meteorology, C. Abbe; On the Deflecting Forces that Produce the Diurnal Variation of the Normal Terrestrial Magnetic Field, F. H. Bigelow (Introduced by C. Abbe); Abstract of Results from the U. S. Coast and Geodetic Survey Magnetic Observatory at Los Angeles, Cal., 1882–1889, part III.; Differential Measures of the Horizontal Component of the Magnetic Force, C. A. Schott; On the Anatomy and Systematic Position of the Mecoptera, A. S. Packard; On the Laws of the Variation of Latitude, S. C. Chandler; On the Causes of Variations of Period in the Variable Stars, S. C. Chandler; On the Force of Gravity at Washington, T. C. Mendenhall; On the Recent Variations of Latitude at Washington, T. C. Mendenhall; On the Acoustic Properties of Aluminum, with Experimental Illustrations, A. M. Mayer; Description of the Silver Haloid Molecule by Mechanical Force, M. Carey Lea (Introduced by G. F. Barker); On the Homologies of the Cranial Arches of the Reptilia,